

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER

785.39987X00 filed May 25, 2001

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/856843

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/EP9/10094

17 December 1999 (17.12.99)

17 December 1998 (17.12.98)

TITLE OF INVENTION DEVICE FOR COUPLING ULTRASONIC WAVES INTO A MEDIUM

APPLICANT(S) FOR DO/EO/US

GEBHARDT, Wolfgang; LICHT, Rudolf

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☒ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

## Items 11 to 20 below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☒ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

International Publication No. WO 00/35338 coversheet

International Search Report

Credit Card Payment Form

Figs. 1-2

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

097856843

INTERNATIONAL APPLICATION NO.

PCT/EP9/10094

ATTORNEY'S DOCKET NUMBER

785.39987X00

21. ☒ The following fees are submitted:

**BASIC NATIONAL FEE** (37 CFR 1.492 (a) (1) - (5)):

Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a) (2)) paid to USPTO  
and International Search Report not prepared by the EPO or JPO ..... \$1000.00

International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... \$860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO  
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

**CALCULATIONS PTO USE ONLY**

\$ 860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$ 0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	13 -20 =	0	x \$18.00
Independent claims	1 -3 =	0	x \$80.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00

\$ 0.00  
\$ 0.00  
\$ 0.00

**TOTAL OF ABOVE CALCULATIONS =**

\$ 860.00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above  
are reduced by 1/2.

\$ 0.00

**SUBTOTAL =**

\$ 860.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$ 0.00

**TOTAL NATIONAL FEE =**

\$ 860.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$ 40.00

**TOTAL FEES ENCLOSED =**

\$ 900.00

Amount to be  
refunded: \$

charged: \$

- a. ☐ A check in the amount of \$ \_\_\_\_\_ to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 01-2135. A duplicate copy of this sheet is enclosed.
- d. ☒ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card  
information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Donald E. Stout  
Antonelli, Terry, Stout & Kraus, LLP  
1300 North Seventeenth Street  
Suite 1800  
Arlington, VA 22209

SIGNATURE

Donald E. Stout

NAME

26,422

REGISTRATION NUMBER

785.39987X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: W. GEBHARDT et al.  
Serial No.: (Not Yet Assigned)  
Filed: (On Even Date Herewith)  
For: DEVICE FOR COUPLING ULTRASONIC WAVES INTO A  
MEDIUM  
Art Unit: (Not Yet Assigned)  
Examiner: (Not Yet Assigned)

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

May 25, 2001

Sir:

Prior to calculation of the filing fee, please amend the above-identified application as follows.

IN THE CLAIMS

Please amend claims 3, 4, 5, 7, 9, 10, 11, 12 and 13 as follows:

3. The device according to claim 1, wherein said flow of gas being air, preferably compressed air.
4. The device according to claim 1, wherein a compressed-air line being connected to said first opening.

5. The device according to claim 2, wherein said housing having a surface, which is provided with at least said second opening, facing said boundary surface.

7. The device according to claim 1, wherein sound-conducting means for deflecting and/or concentrating ultrasonic waves being provided inside said closed volume.

9. The device according to claim 7, wherein a funnel-shaped sound-conducting means being provided which leads said ultrasonic waves from said ultrasonic transducer to an opening in such a manner that said ultrasonic waves pass through said opening as unimpeded as possible by the gas flow.

10. The device according to claim 5, wherein said flow of gas passing through said opening facing said boundary surface flowing between the upper side of said housing facing said boundary surface and said boundary surface flowing radially in relation to said opening to the outside, with a vacuum developing which draws said housing toward said boundary surface to such a degree until a kind of gas cushion is created having a thickness at which the forces of attraction being created by said vacuum and the immanent forces of repulsion present due to the mass impulse of the flow of gas between said housing and said boundary surface are in equilibrium.

11. The device according to claim 1, wherein two ultrasonic transducers, preferably a transmitter transducer and a receiver transducer, being provided.

12. The device according to claim 1, wherein said medium into which the ultrasonic waves couple in being a solid body.

13. The device according to claim 1, wherein said medium into which the ultrasonic waves couple in being biological tissue.

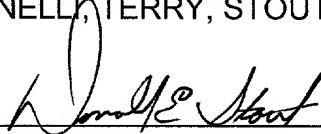
#### REMARKS

The claims have been amended to remove multiple dependent claims prior to calculation of the filing fee.

Please charge any shortage in fees due in connection with the filing of this paper, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (785.39987X00).

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



Donald E. Stout  
Registration No. 26,422

DES:pc  
(703) 312-6600

Attachment

### MARKED-UP ORIGINAL CLAIMS

3. The device according to claim 1 ~~or 2~~, wherein said flow of gas being air, preferably compressed air.

4. The device according to ~~one of the claims 1 to 3~~, claim 1, wherein a compressed-air line being connected to said first opening.

5. The device according to ~~one of the claims 2 to 4~~, claim 2, wherein said housing having a surface, which is provided with at least said second opening, facing said boundary surface.

7. The device according to ~~one of the claims 1 to 6~~, claim 1, wherein sound-conducting means for deflecting and/or concentrating ultrasonic waves being provided inside said closed volume.

9. The device according to ~~claim 7 or 8~~, claim 7, wherein a funnel-shaped sound-conducting means being provided which leads said ultrasonic waves from said ultrasonic transducer to an opening in such a manner that said ultrasonic waves pass through said opening as unimpeded as possible by the gas flow.

10. The device according to ~~one of the claims 5 to 9~~, claim 5, wherein said flow of gas passing through said opening facing said boundary surface flowing between the upper side of said housing facing said boundary surface and said

boundary surface flowing radially in relation to said opening to the outside, with ~~an~~ a vacuum developing which draws said housing toward said boundary surface to such a degree until a kind of gas cushion is created having a thickness at which the forces of attraction being created by said vacuum and the immanent forces of repulsion present due to the mass impulse of the flow of gas between said housing and said boundary surface are in equilibrium.

11. The device according to ~~one of the claims 1 to 10;~~ claim 1, wherein two ultrasonic transducers, preferably a transmitter transducer and a receiver transducer, being provided.

12. The device according to ~~one of the claims 1 to 11;~~ claim 1, wherein said medium into which the ultrasonic waves couple in being a solid body.

13. The device according to ~~one of the claims 1 to 12;~~ claim 1, wherein said medium into which the ultrasonic waves couple in being biological tissue.

1/PRTS

09/856843

JC18 Rec'd PCT/PTO 2 5 MAY 2001

## **Device for Coupling Ultrasonic Waves into a Medium**

### **Technical Field**

The present invention relates to a device for coupling ultrasonic waves into a medium via a boundary surface, having at least one ultrasonic transducer unit, which couples the ultrasonic waves into the medium via a coupling medium provided between the ultrasonic-wave-generating unit and the boundary surface.

### **State of the Art**

Devices of the aforementioned type are employed for non-destructive examination of materials and, moreover, find widespread use in medicine for diagnosing inside the human body, for example physical examinations during pregnancy.

The interaction of ultrasound and preferably solid bodies is based, similar to light in glass, on absorption (weakening), reflection and refraction. Reflection and refraction occur at the boundary surface between two substances of different physical properties, e.g. at a boundary surface of a body. As these differences are often small, in particular in the case of composite materials, high sensitivity of the receiver device is a prerequisite by means of which the backreflected ultrasonic waves can be detected. Frequently ultrasound emitters and ultrasound receivers are integrated in one unit and are known as ultrasonic transducer systems. In order to be able to use an ultrasonic transducer both as an emitter and as a receiver, ultrasonic waves are emitted in short intervals and the reflected ultrasound is received in the pauses.

### **Description of the Invention**

The object of the present invention is to improve a device for coupling ultrasonic waves into a medium via a boundary surface, having at least one ultrasonic transducer unit which couples ultrasonic waves into the medium via a coupling

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medium provided between the ultrasonic-wave- generating unit and the boundary surface in such a manner that the degree of coupling-in, that is the degree with which the ultrasound is coupled into the medium, is distinctly raised. Moreover, the object is also to achieve close coupling between the ultrasonic waves generating unit and the-to-be-examined medium for better detection of the ultrasonic waves reflected at the medium.

The solution to the object forming the basis of the present invention is set forth in claim 1. Advantageous further improvements are described in the subject matter of the subclaims as well as in the specification and in the preferred embodiments.

In air-coupled excitation of the ultrasonic waves, in which the air is utilized as the coupling medium, according to the present invention, a so-called compressed-air sliding shoe, a device which will be described in the following, is employed to decisively improve energy balance.

Air-coupled excitation of ultrasonic waves refers to the ultrasonic transducer unit generating ultrasonic waves in the air, with these ultrasonic waves hitting the boundary surface respectively a solid body surface at a suited angle after passing a more or less long path and excite indirect waves so-called density waves or shear waves or surface waves running along the surface of the solid body, so-called Rayleigh waves or creeping waves, in the medium respectively in a solid body. In this way, various plate-wave modes can be excited even at plate-shaped materials.

The invented device according to the generic part of claim 1, is distinguished by the fact that the ultrasonic waves generated by the ultrasonic transducer unit are directed into a closed volume provided with at least a first opening and a second opening, that a flow of gas, which ensures that there is an overpressure inside the closed volume and simultaneously represents the coupling medium, is directed into the interior of the volume through the first opening, and that the second opening, through which the flow of gas coming from the volume exits, faces the boundary surface directly.

Preferably compressed air is introduced as the coupling medium into the interior of the closed volume, which is enclosed in a housing. The compressed air flows out through at least one opening on the side of the housing facing the boundary surface. Due to the selective outflow of the compressed air at the underside of the housing of the so-called compressed-air sliding shoe, the sliding shoe is actually sucked to the boundary surface due to the so-called compressed hydrodynamic paradox, thereby yielding very close coupling between the housing and the boundary surface. This again results in a, for the most part, constant distance between the device and the boundary surface thereby improving measuring conditions considerably.

As an alternative to the hydrodynamic paradox effect, the intensity of the gas flow can be raised further in such a manner that a kind of air cushion is formed between the device and the boundary surface so that the entire device hovers over the boundary surface like a kind of hovercraft.

The main advantage of the closed volume, to which compressed-air is applied, inside the compressed-air sliding shoe is that due to the pressure-dependent higher air density inside the housing, the ultrasonic waves can couple more effectively into the medium, which is preferably a solid body, via the boundary surface. Usually the pressure inside the compressed-air sliding shoe is approximately 10 times higher than in the surroundings. Thus, the ultrasonic waves can be coupled into the medium 10 times better.

The purpose of the invented device is coupling in ultrasonic waves preferably at those technical surfaces which, due to cleaning conditions or similar circumstances, cannot be directly contacted with a probe. With the invented device, ultrasonic waves can be coupled in highly effectively via the boundary surface without touching it and without very complicated technology regarding sealing measures connected with maintaining the air pressure inside the housing respectively inside the compressed-air sliding shoe because the pressure conditions set in automatically as a result of the so-called hydrodynamic paradox.

For further details, reference is made to the following preferred embodiments.

### **Brief Description of the Invention**

The present invention is made more apparent in the following using preferred embodiments with reference to the accompanying drawings by way of example without the intention of limiting the scope or spirit of the inventive idea. Depicted is in:

Fig. 1 a cross section of an advantageous embodiment

Fig. 2 a cross section of an advantageous alternative embodiment.

### **Ways of Carrying Out the Invention, Commercial Applicability**

In the simplest form of a preferred embodiment (see figure 1), the compressed air flows into the closed volume 1, which is enclosed by a housing 2. The housing 2 is provided with two openings 3, 4. The compressed air flows into the interior of the housing 2 through opening 3 through a compressed-air line 5 attached thereto. The compressed-air escapes to the outside through the other opening 4. An ultrasonic transducer unit 6, preferably placed on the side facing opening 4, is provided inside the housing 2 in such a manner that the ultrasonic waves can be released directed at the opening 4. In this case, opening 4 also acts as a sound-exit opening.

Preferably, delay-time-controlled stack transducers can be used as ultrasonic transducer units. Conventional transducers can also be built into the compressed-air sliding shoe. In particular for low frequency applications, the individual plates of the stack can be excited in phase. Conventional single oscillator transducers can, of course, also be built in.

The compressed-air flow 9 developing radially between the underside 7 of the housing and the probe surface respectively boundary surfaces 8 generates a vacuum between the two surfaces which draws the compressed-air sliding shoe to the probe

surface 8. The diminishing distance between the underside of the sliding shoe and the probe surface 8 raises flow velocity, which for its part leads to increased contact force. Equilibrium sets in when the force of attraction generated by the radial flow equals the force of repulsion (caused by the pressure building up inside the sliding shoe). The width of the air gap between the underside of the sliding shoe and the probe surface and the amount of pressure inside the sliding shoe depend on the geometric design.

However, the described simplest version of the compressed sliding shoe has certain drawbacks which are caused by gas-flow turbulences inside the housing 2: therefore, in particular, causing the occurrence of disturbing fluctuations in the shape and the amplitude of the ultrasonic pulses inside the housing 2. In order to reduce these disturbances, suited sound-conducting means 10 are built into the interior of the housing 2 in order to deflect the ultrasonic waves accordingly and/or to concentrate, for example on the sound-exit opening 4. The purpose of the sound-conducting means 10 is, in particular, to separate the spatial zone passed by the ultrasonic waves and a spatial zone in which the gas flow introduced into the housing can develop freely. In figure 2, a funnel insert, which concentrates the ultrasonic waves coming from the ultrasonic transducer unit in the direction of the sound-exit opening 4, is provided as the sound-conducting means 10.

The interaction volume between the turbulent compressed air and sound is therefore very much limited which reduces turbulent effects accordingly. Fundamentally instead of a funnel, all built-in elements such as baffle plates, hole filters etc. can be used which contribute to a laminating or calming the air flow. Of course, any other gas (e.g. CO<sub>2</sub>) can be employed instead of compressed air.

Moreover, the sound-exit opening and other compressed-air openings can be disposed on the housing separated from each other.

Depending on the application, the ultrasonic transducer unit 6 can be built into the housing perpendicular to the probe surface 8 or slanted to generate oblique ultrasonic waves. If transmission and reception are realized with two ultrasonic

transducers, they can be built into separate sliding shoes or into a common sliding shoe. In the latter case, the two transducers can have separate sound-exit openings with separate baffles for suppressing turbulences or common sound-exit openings with a common baffle for suppressing turbulences. The geometric arrangement (slanted position, spacing) is adapted depending on the application (testing thick components or thin components, exciting spatial waves, surface waves or plate waves).

**List of Reference Numbers**

- 1 closed volume
- 2 housing
- 3,4 openings
- 5 compressed-air line
- 6 ultrasonic transducer unit
- 7 underside
- 8 boundary surface, probe surface
- 9 compressed-air flow
- 10 sound-conducting means

**What Is Claimed Is:**

1. A device for coupling in ultrasonic waves into a medium via a boundary surface, having at least one ultrasonic-wave transducer unit, which couples ultrasonic waves into said medium via a coupling medium provided between the ultrasonic-wave-generating unit and said boundary surface,  
**wherein** the ultrasonic waves generated by said ultrasonic transducer unit being directed into a closed volume, which is provided with at least a first opening and a second opening,  
a flow of gas, which ensures an overpressure inside said closed volume and simultaneously represents said coupling medium, being directed into the interior of said volume through said first opening, and  
said second opening, through which a flow of gas coming from inside said volume exits, directly facing said boundary surface.
2. The device according to claim 1,  
**wherein** said closed volume being bordered by a housing in which said ultrasonic transducer is insertable or integrated in such a manner that the ultrasonic waves are directed at said opening directly facing said boundary surface.
3. The device according to claim 1 or 2,  
**wherein** said flow of gas being air, preferably compressed air.
4. The device according to one of the claims 1 to 3,  
**wherein** a compressed-air line being connected to said first opening.
5. The device according to one of the claims 2 to 4,  
**wherein** said housing having a surface, which is provided with at least said second opening, facing said boundary surface.

**wherein** said housing in which said surface facing said boundary surface being provided with a third opening at which the ultrasonic waves are directed by corresponding alignment of said ultrasonic transducer unit.

**wherein** sound-conducting means for deflecting and/or concentrating ultrasonic waves being provided inside said closed volume.

**wherein** said sound-conducting means being plane elements, such as baffle plates, which separate a first spatial zone inside said closed volume, in which ultrasonic waves can propagate for the most part without the interference by gas flows, and a second spatial zone in which said gas flow is directed.

**wherein** a funnel-shaped sound-conducting means being provided which leads said ultrasonic waves from said ultrasonic transducer to an opening in such a manner that said ultrasonic waves pass through said opening as unimpeded as possible by the gas flow.

**wherein** said flow of gas passing through said opening facing said boundary surface flowing between the upper side of said housing facing said boundary surface and said boundary surface flowing radially in relation to said opening to the outside, with an vacuum developing which draws said housing toward said boundary surface to such a degree until a kind of gas cushion is created having a thickness at which the forces of attraction being created by said vacuum and the immanent forces of repulsion present due to the mass impulse of the flow of gas between said housing and said boundary surface are in equilibrium.



11. The device according to one of the claims 1 to 10,  
**wherein** two ultrasonic transducers, preferably a transmitter transducer and a receiver transducer, being provided.
12. The device according to one of the claims 1 to 11,  
**wherein** said medium into which the ultrasonic waves couple in being a solid body.
13. The device according to one of the claims 1 to 12,  
**wherein** said medium into which the ultrasonic waves couple in being biological tissue.

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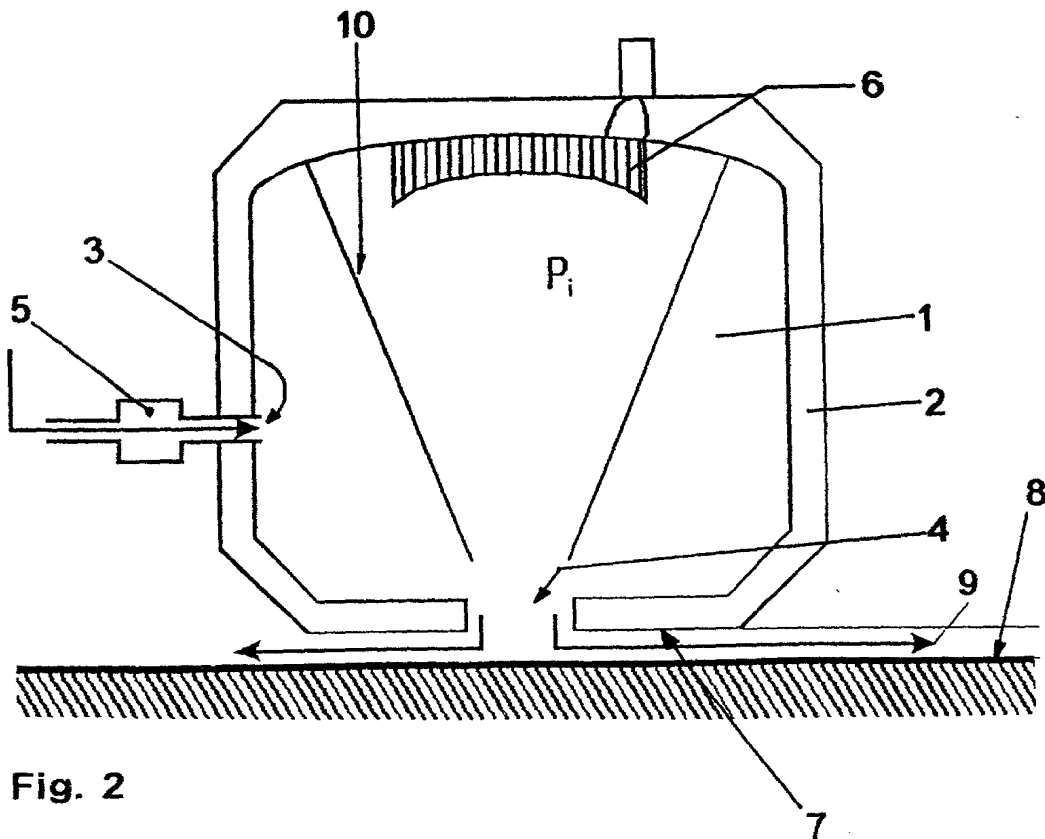
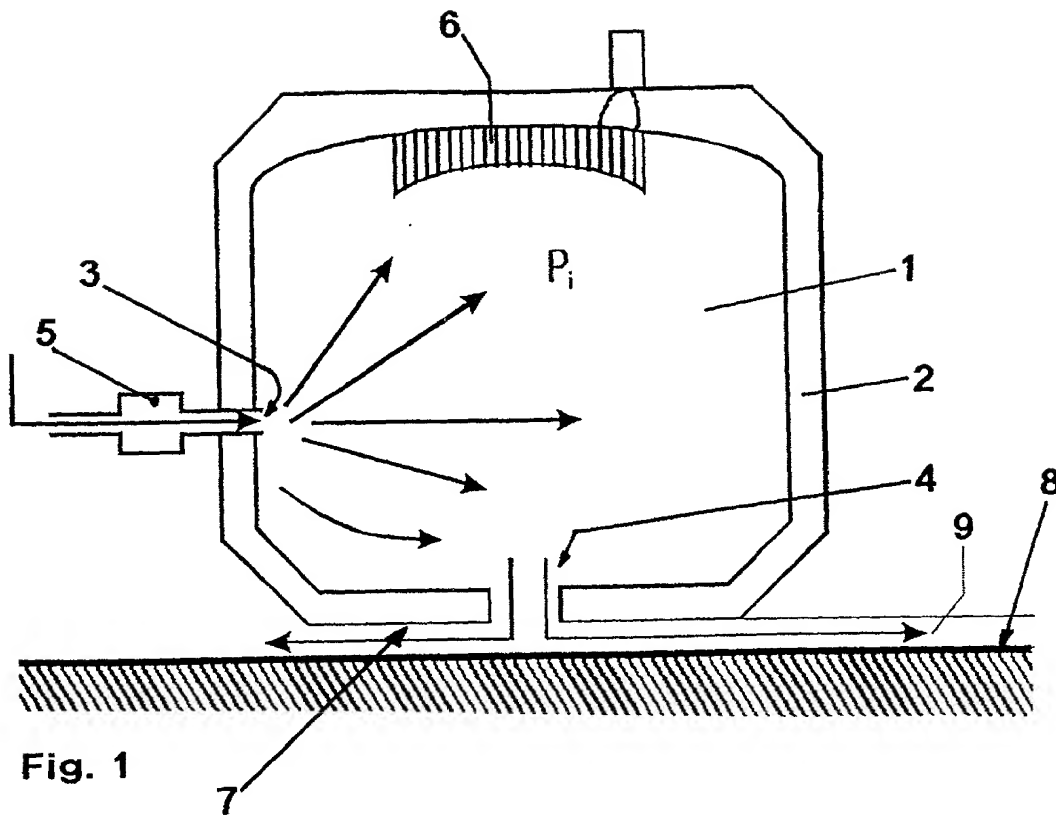
### Abstract

Disclosed is a device for coupling in ultrasonic waves into a medium via a boundary surface, having at least one ultrasonic-wave transducer unit, which couples ultrasonic waves into the medium via a coupling medium provided between the ultrasonic-wave-generating unit and the boundary surface.

The invention is distinguished by the ultrasonic waves generated by the ultrasonic transducer unit being directed into a closed volume, which is provided with at least a first opening and a second opening, a flow of gas, which ensures an overpressure inside the closed volume and simultaneously represents the coupling medium, being directed into the interior of said volume through the first opening, and the second opening, through which a flow of gas coming from inside said volume exits, directly facing the boundary surface.

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T052504-052504

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**DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION**

As a below named inventor, I hereby declare that: my residence, post office address and country of citizenship are as stated below, next to my name; I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

the specification of which

X is attached hereto.

— was filed on \_\_\_\_\_ as

United States Application Number \_\_\_\_\_

or PCT International Application Number PCT/EP99/10094

and was amended on \_\_\_\_\_

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d), of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

**Prior Foreign Application(s)**

**Priority  
Claimed**

<u>198 61 017.3</u>	<u>DE</u>	<u>17/December/1998</u>	<u>X</u>	
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)		

I hereby claim the benefit under title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below

_____	_____
(Application Number)	Filing Date
_____	_____
(Application Number)	Filing Date

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

_____	_____	_____
(Application Number)	Filing Date	(Status -- patented, pending, abandoned)

Please type a plus sign (+) inside this box → ☐

PTO/SB/122 (11-96)  
Approved for use through 6/30/99. OMB 0651-0035  
Patent and Trademark Office: DEPARTMENT OF COMMERCE  
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# CHANGE OF CORRESPONDENCE ADDRESS *Application*

Address to:  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Application Number

Filing Date

First Named Inventor

Group Art Unit

Examiner Name

Attorney Docket Number

May 25, 2001

Wolfgang GEBHARDT

785.39987X00

0577856843  
JC18 Rec'd PCT/PTO 25 MAY 2001

Please change the Correspondence Address for the above-identified application to:



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I am the :

☐

Applicant.

☐

Assignee of record of the entire interest.  
Certificate under 37 CFR 3.73(b) is enclosed.

☒

Attorney or agent of record.

Typed or  
Printed Name

Donald E. Stout

Registration NO.

26,422

Signature

Date

May 25, 2001

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I hereby appoint: Donald R. Antonelli, Reg. No. 20,296; Melvin Kraus, Reg. No. 22,466; William I. Solomon, Reg. No. 28,565; Gregory E. Montone, Reg. No. 28,141; Ronald J. Shore, Reg. No. 28,577; Donald B. Stout, Reg. No. 26,422; Alan E. Schiavelli, Reg. No. 32,087; James N. Dresser, Reg. No. 22,973; Carl I. Brundidge, Reg. No. 29,621; Paul J. Skwierawski, Reg. No. 32,173; and Robert M. Bauer, Reg. No. 34,487, my attorneys; of ANTONELLI, TERRY, STOUT & KRAUS, LLP with offices located at 1300 North Seventeenth Street, Suite 1800, Arlington, Virginia 22209, telephone: (703) 312-6600, fax: (703) 312-6666; with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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